

PATENT  
Attorney Docket No. 20496-499

**IN THE UNITED STATES PATENT AND TRADEMARK OFFICE**

APPLICANT: Heinz Sibum et al. CONFIRMATION NO.: 9590  
SERIAL NO.: 10/560,977 GROUP NO.: 1793  
FILING DATE: August 16, 2006 EXAMINER: Caitlin Anne Fogarty  
TITLE: Beta-titanium alloy, method for the production of a hot-rolled product  
from an alloy of this type, and uses thereof

Commissioner for Patents  
P.O. Box 1450  
Alexandria, VA 22313-1450

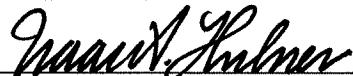
**REQUEST FOR REFUND**

Applicants respectfully request a refund in the amount of \$364.00 to Deposit Account No. 50-3081 because Applicants were overcharged by this amount as a result of a Patent Office error. The facts supporting the conclusion that \$364.00 was charged in error are set forth in items 1-4 below and documented in the attached Exhibit A.

1. On 08/16/2006, Applicants paid for 5 excess claims and for multiple dependent claims.
2. On 03/02/2009, Applicants amended the claims, which resulted in 25 pending claims after accounting for multiple dependencies.
3. Nevertheless, in response to the 03/02/2009 amends to the claims, the Patent Office charged Applicant for seven extra claims in the amount of \$364.00.
4. The Patent Office's charge is in error because the number of claims after the amendment on 03/02/2009 is equal to the number of claims that had previously been paid for on 08/16/2006.

Because the set \$364.00 was charged in error, Applicants respectfully request a refund of the \$364.00 excess claims fee to Deposit Account No. 50-3081.

Respectfully submitted,



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Date: September 16, 2010

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# **EXHIBIT A**

**PATENT**  
**Attorney Docket No.: 20496-499**

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**RESPONSE TO NON-FINAL OFFICE ACTION**

This paper is in response to the non-final Office Action mailed from the U. S. Patent Office on September 2, 2008, for which the shortened statutory period was set to expire on December 2, 2008. Applicants hereby request a three-month extension of time until March 2, 2009 and authorize the Commissioner to charge the three-month extension fee to Attorney's Deposit Account No.: 50-3081. In the event any additional fees are due, the Commissioner is hereby authorized to charge any such fees to Attorney's Deposit Account No.: 50-3081.

Applicants respectfully request entry of this Response, in which:

- **Amendments to the claims** begin on page 2.
- **Remarks** begin on page 6.

**Amendments to the Claims**

This listing of the claims will replace all prior versions and listings of the claims in the application.

**Listing of Claims**

1. (Currently amended) Beta titanium alloy containing (in mass %):

V: [[10]] 13 to 17%,

Fe: 2 to 5%,

Al: 2 to 5%,

Mo: 0.1 to 3%,

and optionally one or more alloy elements from the group of Sn, Si, Cr, Nb, Zr according to the following proportions:

Sn: 0.1 to 3%,

Si: 0.1 [[≤]] to 2%

Cr: ≤ 2%,

Nb: ≤ 2%,

Zr: ≤ 2%

wherein the beta titanium alloy may additionally comprise contents of C and of elements from the group of the lanthanides,

and as the remainder Ti and inevitable impurities.

2. (Currently amended) Beta titanium alloy containing (in mass %) :

V: [[10.00]] 13.00 to 17.00%,

Fe: 2.00 to 5.00%,  
Al: 2.00 to 5.00%,  
Mo: 0.10 to 3.00%,

and optionally one or more alloy elements from the group of Sn, Si, Cr, Nb, Zr according to the following proportions:

Sn: 0.10 to 3.00%,  
Si: 0.10 to 2.00%,  
Cr: ≤ 2.00%,  
Nb: ≤ 2.00%,  
Zr: ≤ 2.00%,

and as the remainder Ti and inevitable impurities.

3. (Canceled).
4. (Currently amended) Beta titanium alloy according to claim 1 or 2 any one of the preceding claims, containing 0.5 to 3 mass % Mo.
5. (Currently amended) Beta titanium alloy according to claim 1 or 2 any one of the preceding claims, containing 0.5 to 3 mass % Sn.
6. (Currently amended) Beta titanium alloy according to claim 1 or 2 any one of the preceding claims, characterised in that wherein at ambient temperature it has a yield point  $R_{p0.2}$  of at least 1,400 MPa.
7. (Currently amended) Beta titanium alloy according to claim 1 or 2 any one of the preceding claims, characterised in that wherein at ambient temperature it has a tensile strength  $R_m$  of at least 1,500 MPa.

8. (Currently amended) Beta titanium alloy according to claim 1 or 2 ~~any one of the preceding claims, characterised in that~~ wherein at ambient temperature it has a plastic strain  $\epsilon_{p0.2}$  of more than 4%.

9. (Currently amended) Beta titanium alloy according to claim 1 or 2 ~~any one of the preceding claims, characterised in that~~ wherein its density  $\rho$  does not exceed 4.8 g/cm<sup>3</sup>.

10. (Currently amended) Method for manufacturing a product produced from a beta titanium alloy, comprising the following steps:

melting a beta titanium melt having the composition according to claim 1 or 2 ~~any one of claims 1 to 9~~ to form a preliminary product in block form,  
hot-forming the preliminary product,  
hot end forming the hot-formed preliminary product to form a hot end product,  
solution annealing the hot end product,  
cold-forming the hot end product to form an end product,  
curing treatment of the end product.

11. (Currently amended) Method according to claim 10, ~~characterised in that~~ wherein the hot end forming process is carried out as a hot-rolling process.

12. (Currently amended) Method according to claim 11, ~~characterised in that~~ wherein the hot-rolling process is followed by a coiling process.

13. (Currently amended) Method according to claim 10 ~~claims 10 to 12~~, ~~characterised in that~~ wherein the alloy elements V, Fe and Al are added by alloying in the form of a master alloy.

14. (Currently amended) Method according to claim 10 any one of claims 10 to 13, characterised in that wherein the preliminary products are rounded blocks, which are hot-formed during the hot-forming process to form billets or mill bars.
15. (Currently amended) Method according to claim 10 any one of claims 10 to 14, characterised in that wherein the hot end product is a wire or a metal sheet.
16. (Currently amended) Method according to claim 11 any one of claims 11 to 15, characterised in that wherein the hot end product is solution annealed after the coiling process.
17. (Currently amended) Method according to claim 16, characterised in that wherein the solution annealed hot end product is cold-formed.
18. (Currently amended) Semi-finished product produced from a beta titanium alloy having the composition according to claim 1 or 2 any one of claims 1 to 9.
- 19-22. (Canceled).

**REMARKS**

In the non-final Office Action dated September 2, 2008, the Examiner objected to claims 4-22 as being in improper form. Claim 1 was objected to because of an informality. Claims 19-22 were rejected under 35 U.S.C. §112 as being indefinite, and further under 35 U.S.C. §101 because the claimed recitation of a use results in an improper definition of a process. Claims 1-3 were rejected under 35 U.S.C. § 103(a) as being unpatentable over U.S. 5,264,055 to Champin, et al. (hereinafter "Champin").

By means of the present Amendment, claims 1-2, and 4-18 have been amended. Specifically, claims 1-2 have been amended to include 13-17% vanadium. Support for the amendment can be found, at least on page 3, paragraph 3 of the English language translation of the application as filed. Claims 4-18 have been amended to correct multiple dependencies and place the claims in proper form. Claims 3 and 19-22 have been canceled. Applicants submit that no new matter has been introduced.

In view of the amendments to the claims together with the following remarks, Applicants respectfully request reconsideration and withdrawal of all grounds of objection and rejection.

**Objection to Claims 4-22**

Claims 4-22 were objected to as being in improper form because a multiple dependent claim cannot depend from any other multiple dependent claim. Claims 4-18 have been amended to correct the multiple dependencies. Claims 19-22 have been canceled. In view of the amendments, Applicants respectfully submit that the claims are in proper form and request reconsideration and withdrawal of the objection.

**Objection to Claim 1**

Claim 1 was objected to because of an informality. Claim 1 has been amended to correct the typographical error as per the Examiner's instructions. In view of the amendment, reconsideration and withdrawal of the objection is respectfully requested.

**Rejection of Claims 19-22 under 35 U.S.C. § 112/101**

Claims 19-22 were rejected under 35 U.S.C. §112 as being indefinite, and further under 35 U.S.C. §101 because the claimed recitation of a use results in an improper

definition of a process. Claims 19-22 have been canceled thereby rendering the rejection moot.

**Rejection of Claims 1-3 under 35 U.S.C. § 103(a)**

Claims 1-3 were rejected under 35 U.S.C. § 103(a) as being unpatentable over Champin. The Examiner asserts that the composition of the beta titanium alloy as claimed either overlaps or is within the ranges disclosed in Champin. See pages 4-5 of the Office Action. The Examiner concludes that a *prima facie* case of obviousness exists because a person of ordinary skill in the art at the time the invention was made could select the claimed beta titanium alloy composition from the composition disclosed by Champin because Champin teaches the same utility. See page 5 of the Office Action.

*Champin fails to teach or suggest each and every element of the claims*

Claims 1-2 have been amended. Support for the amendment can be found, at least on page 3, paragraph 3 of the English language translation of the application as filed. Claim 3 has been canceled.

Claims 1 and 2 as amended are directed to a beta titanium alloy containing 13-17% vanadium. The high vanadium content is important because it stabilizes the beta phase of the structure and increases the high temperature strength of the alloy. See page 2, paragraph 4 – page 3, paragraph 3 of the English language translation of the application as filed.

In contrast, Champin discloses a beta titanium alloy composition where vanadium is less than or equal to 12%. Champin discloses adding vanadium to preserve the temperature for the final working of the titanium alloy. See column 4, lines 4-9. In this regard, Champin considers no difference between vanadium and molybdenum. See *id.* Rather, vanadium is simply one of the three elements that together constitute the Mo equivalent of the alloy in Champin. See column 1, lines 50-52.

Moreover, Champin obtains the most interesting properties when the alloy contains Mo, Al, Sn and Zr. See column 4, lines 18-50. Significantly, vanadium is neither a component of the alloy nor mentioned in the explanation concerning a part made from the alloy. See *id.* Therefore, Champin fails to identify any particular characteristics or significance of the vanadium content in the alloy.

In view of the above, Applicants respectfully submit that Champin fails to teach or suggest each and every element of claims 1-2.

*Modifying the composition of Champin would render the resulting alloy unsuitable for its intended purpose*

Champin's objectives are: providing titanium alloy compositions with improved ductility without reducing other mechanical characteristics of the alloy. See column 1, lines 35-41. To obtain the desired properties, Champin discloses alloy compositions where the Mo equivalent (Mo + V + Cr) is 5-13%. See column 1, lines 44-48. Specifically, Champin's alloy compositions contain less than or equal to 12% vanadium. See column 4, lines 4-27. Champin further discloses that when the Mo equivalent is greater than 13%, the resulting alloy lacks the desired mechanical properties, particularly good elongation or ductility. See column 3, lines 23-30.

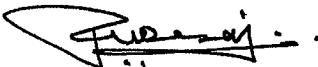
Applicants respectfully submit that if the vanadium content of Champin's alloy was modified and increased to 13-17%, and the molybdenum content modified to 0.1-3.0% as claimed by Applicants, the corresponding Mo equivalent would be greater than 13%, thereby making the modified titanium alloy unsuitable for Champin's intended purpose. That is, according to Champin a titanium alloy having a Mo equivalent of greater than 13% would lose the desired mechanical properties because the beta phase of the alloy would be too stable during cooling, causing insufficient conversion of beta phase to alpha phase at the grain joints. See id. As the modification of Champin's disclosed composition would result in an alloy unsuitable for Champin's intended purposes, Applicants respectfully submit that a person of ordinary skill in the art would not have modified Champin's composition to the alloy composition as claimed by Applicants.

In view of the above, Applicants respectfully submit that claims 1-2 are patentable over Champin because a person of ordinary skill in the art at the time the invention was made would be motivated not to modify Champin such as exceeding the disclosed vanadium content and/or exceeding the Mo equivalent. Reconsideration and withdrawal of the rejection is respectfully requested.

**CONCLUSION**

Applicants respectfully request favorable consideration of all pending claims. If the Examiner believes that a telephone conversation with the Applicants' agent would expedite allowance of this application, the Examiner is invited to call the undersigned agent at (617) 526-9747.

Respectfully submitted,



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Date: March 2, 2009  
Reg. No. L0312  
Tel. No.: (617) 526-9747  
Fax No.: (617) 526-9899

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Boston, MA 02110-2600

<b>Electronic Patent Application Fee Transmittal</b>				
<b>Application Number:</b>	10560977			
<b>Filing Date:</b>	16-Aug-2006			
<b>Title of Invention:</b>	Beta-titanium alloy, method for the production of a hot-rolled product from an alloy of this type, and uses thereof			
<b>First Named Inventor/Applicant Name:</b>	Heinz Sibum			
<b>Filer:</b>	Pankaj Navin Desai			
<b>Attorney Docket Number:</b>	20496-499			
Filed as Large Entity				
<b>U.S. National Stage under 35 USC 371 Filing Fees</b>				
Description	Fee Code	Quantity	Amount	Sub-Total in USD(\$)
<b>Basic Filing:</b>				
<b>Pages:</b>				
<b>Claims:</b>				
<b>Miscellaneous-Filing:</b>				
<b>Petition:</b>				
<b>Patent-Appeals-and-Interference:</b>				
<b>Post-Allowance-and-Post-Issuance:</b>				
<b>Extension-of-Time:</b>				
Extension - 3 months with \$0 paid	1253	1	1110	1110

Description	Fee Code	Quantity	Amount	Sub-Total in USD(\$)
<b>Miscellaneous:</b>				
<b>Total in USD (\$)</b>				<b>1110</b>



Document code: WFEE

United States Patent and Trademark Office  
Sales Receipt for Accounting Date: 03/20/2009

KHARRIS1 SALE #00000001 Mailroom Dt: 03/02/2009 503081 10560977  
01 FC : 1202 364.00 DA

PATENT APPLICATION FEE DETERMINATION RECORD

Effective December 8, 2004

Application or Docket Number

10/560977

CLAIMS AS FILED - PART I

	(Column 1)	(Column 2)
U.S. NATIONAL STAGE FEES		
BASIC FEE	SMALL ENT. = \$ 150	LARGE ENT. = \$ 300
EXAMINATION FEE	Satisfies PCT Article 33(1)-(4) = \$ 50 / \$ 100	All other situations = \$ 100 / \$ 200
SEARCH FEE	All other situations (ie. No Search Rpt.) = \$ 250 / \$ 500	U.S. Is ISA = \$ 50 / \$ 100 ALL other countries = \$ 200 / \$ 400
FEE FOR EXTRA SPEC. PGS.	minus 100 =	/ 50 =
TOTAL CHARGEABLE CLAIMS	25 minus 20 = *	5
INDEPENDENT CLAIMS	2 minus 3 = *	
MULTIPLE DEPENDENT CLAIM PRESENT		<input checked="" type="checkbox"/>

\* If the difference in column 1 is less than zero, enter "0" in column 2

SMALL ENTITY  
TYPE

OR

OTHER THAN  
SMALL ENTITY

RATE	FEES	RATE	FEES
BASIC FEE		BASIC FEE	300
EXAM. FEE		EXAM. FEE	250
SEARCH FEE		SEARCH FEE	400
X \$ 125 =		X \$ 250 =	
X \$ 25 =		X \$ 50 =	250
X \$ 100 =		X \$ 200 =	
+ \$ 180 =		+ \$ 360 =	360
TOTAL		TOTAL	150

CLAIMS AS AMENDED - PART II

	(Column 1)	(Column 2)	(Column 3)
AMENDMENT A	CLAIMS REMAINING AFTER AMENDMENT		HIGHEST NUMBER PREVIOUSLY PAID FOR
	Total	*	Minus ** =
Independent	*	Minus ***	=
FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM			<input type="checkbox"/>

SMALL ENTITY

OR

OTHER THAN  
SMALL ENTITY

RATE	ADDI- TIONAL FEE	RATE	ADDI- TIONAL FEE
X \$ 25 =		X \$ 50 =	
X \$ 100 =		X \$ 200 =	
+ \$ 180 =		+ \$ 360 =	
TOTAL ADDIT. FFF		TOTAL ADDIT. FFF	

	(Column 1)	(Column 2)	(Column 3)
AMENDMENT B	CLAIMS REMAINING AFTER AMENDMENT		HIGHEST NUMBER PREVIOUSLY PAID FOR
	Total	*	Minus ** =
Independent	*	Minus ***	=
FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM			<input type="checkbox"/>

RATE	ADDI- TIONAL FEE
X \$ 25 =	
X \$ 100 =	
+ \$ 180 =	
TOTAL ADDIT. FFF	

RATE	ADDI- TIONAL FEE
X \$ 50 =	
X \$ 200 =	
+ \$ 360 =	
TOTAL ADDIT. FFF	

\* If the entry in column 1 is less than the entry in column 2, write "0" in column 3.

\*\* If the "Highest Number Previously Paid For" IN THIS SPACE is less than '20', enter "20".

\*\*\* If the "Highest Number Previously Paid For" IN THIS SPACE is less than '3', enter "3".

The "Highest Number Previously Paid For" (Total or Independent) is the highest number found in the appropriate box in column 1.

PATENT APPLICATION SERIAL NO. \_\_\_\_\_

**U.S. DEPARTMENT OF COMMERCE  
PATENT AND TRADEMARK OFFICE  
FEE RECORD SHEET**

12/22/2005 GFREY1 00000051 162500 10560977

01 FC:1631 300.00 DA  
02 FC:1633 200.00 DA  
03 FC:1632 500.00 DA

04/24/2007 MKAYPAGH 00000004 162500 10560977

01 FC:1615 250.00 DA  
02 FC:1616 360.00 DA

**PTO-1556  
(5/87)**